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(12) UK Patent Application (19) GB (11) 2 130 070 A

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(21) Application No 8330703  
(22) Date of filing 17 Nov 1983

(30) Priority data

(31) 8232948

(32) 18 Nov 1982

(33) United Kingdom (GB)

(43) Application published  
31 May 1984

(51) INT CL<sup>3</sup>  
A23L 2/00

(52) Domestic classification  
A2B 330 412 501 BD

(56) Documents cited  
GB 1331518

(58) Field of search  
A2B

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(54) Improvements in or relating to  
semi-frozen or fluid ice drinks

(57) A process for providing a storable  
product which can be converted into a  
semi-frozen or fluid ice drink,  
comprises diluting a neutral base  
containing sugar or other sweetening  
agent with water, the so-produced

product then being broken down into  
a fine granulated, comminuted or  
crushed form of product which will not  
solidify when returned to a cold  
storage location.

The weight of sugar or other  
sweetening agent in the storable  
product is preferably from 10 to 35%  
by weight.

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## SPECIFICATION

## Improvements in or relating to semi-frozen or fluid ice drinks

The present invention is concerned with improvements in or relating to semi-frozen or fluid ice drinks. In particular, the present invention relates to drinks which are referred to by the generic name "slush drinks".

Semi-frozen or fluid ice drinks may be made from a neutral base, containing approximately 50% by weight sugar or other sweetening agent, by dilution with water, generally in a ratio of 5 parts by volume water to 1 part by volume neutral base, and the resultant mixture is converted into a semi-frozen or fluid ice form. Such production is carried out in a special type of apparatus into which the neutral base and water are added in the ratio referred to above. The apparatus acts in such a manner as to produce the semi-frozen or fluid ice which comprises the slush drink. After the addition of desired colouring and/or flavouring, the drink is dispensed as required.

Although such apparatus operates in an efficient manner it is extremely costly to purchase. In addition, since it is not possible to store the slush drink, it is necessary for such apparatus to be used at each location at which the drink is offered for sale. Whilst a large retail outlet could economically justify installation of such apparatus, in smaller premises the sales are not sufficient to warrant the installation of such costly apparatus. However, the problem to date has been that no method exists for production of semi-frozen or fluid ice drinks which does not require utilisation of the apparatus at present available. Moreover, if a storable product were available, then same could be offered for home use from freezer outlets or stores.

If a semi-frozen or fluid ice drink made by the apparatus referred to above was placed in a refrigerator or deep freeze in an attempt to store same, it has been found that the drink would become a solid block and could not be used again.

It is an object of the present invention to dispense with such apparatus, by providing a method which enables a storable product to be prepared from which semi-frozen or fluid ice drinks can be made.

We have surprisingly discovered that if the degree of dilution of the neutral sugar base is reduced as compared to dilution levels utilised heretofore then a product is obtained which can be kept in a refrigerator or like cold storage location and which product, upon further dilution, produces a semi-frozen or fluid ice drink.

According to the present invention there is provided a process for providing a storable product which can be converted into a semi-frozen or fluid ice drink, comprising diluting a neutral base containing sugar or other sweetening agent with water, the so produced diluted product then being frozen, and broken down into a fine granulated comminuted or crushed form of product which will not solidify when returned to a cold storage

location.

Preferably, the sugar or other sweetening agent content of the product of the invention will amount to from 10 to 35% by weight, more preferably 15 to 27%, and desirably 15% by weight.

Such end product can be further diluted to produce the semi-frozen or fluid ice form. Appropriate colouring and/or flavouring may then be added thereto to produce the desired drink.

Thus, we have found that if the neutral sugar base is diluted to a less amount than has been utilised heretofore in the production of semi-frozen or fluid ice drinks (slush drinks) then such product may be frozen, broken down and then returned to a freezer without subsequently solidifying.

Accordingly, the present invention includes within its scope any neutral base containing sugar or other sweetening agent which is diluted with water in an amount to produce a product which after being frozen is capable of being broken down into a fine granular comminuted or crushed form and which, when returned to a cold storage location, will not solidify.

The neutral sugar base generally used contains approximately 50% by weight sugar or other sweetening agent. When using such base in the invention, same is diluted with water to a dilution of 1 part by volume of base to less than 5 parts by volume water.

We have found that the product of the invention produced by dilution of such neutral sugar base with water, should preferably have a sugar or other sweetening agent content of from 10 to 35%, desirably 15% to 27%, especially 15%, by weight.

A semi-frozen or fluid ice drink is known which is produced from 5 parts by volume water to 1 part by volume neutral base containing approximately 50% by weight sugar or other sweetening agent. In accordance with an embodiment of the present invention, such neutral base containing sugar or other sweetening agent is diluted with water in a ratio of 1/2 part by volume water to 1 part by volume neutral base to 4 parts by volume water to 1 part by volume neutral base, more preferably 2 to 4 parts by volume water to 1 part by volume neutral base. A preferred ratio is approximately 3 parts by volume water to 1 part by volume neutral base. Such diluted product is then frozen, broken down into a fine granulated, comminuted or crushed form and returned to a cold storage location.

It can thus be seen that the product of the present invention can be supplied to small retailers by refrigerated transport and the product then kept in a freezer. When the retailer wishes to prepare a semi-frozen or fluid ice drink, the product of the invention is withdrawn from the freezer and is diluted. The retailer then adds the desired colouring and/or flavouring.

The following Table shows the relationship between the ratio of a neutral base containing approximately 50% by weight sugar to water and

percentage sugar content of the final product in accordance with the invention.

TABLE

Ratio of neutral base : water (by volume)	Sugar content (by weight)
1:4	11%
1:3	15%
1:2	19%
1:1.5	22%
1:1	27%
1:0.75	30%
1:0.5	35%

It is evident that the product of the present invention enables small retailers to manufacture semifrozen or fluid ice drinks without having to purchase expensive apparatus heretofore considered essential. Also since the product of the invention is storable, it is now possible to make same available to the public for home use.

The novel discovery of the present invention is that by reducing the dilution of the neutral sugar base with water, a product can be obtained which after freezing and breaking down thereof will not solidify but will remain in a frozen granulated, comminuted or crushed form.

The neutral sugar base utilised may be any one that is well known in the art and may comprise water, sugar or other sweetening agent, stabilizer, fruit acids, saccharin and preservative. The neutral base may contain glucose, the fruit acid is preferably citric acid and the preservative is preferably sodium benzoate.

When such neutral sugar base is diluted in the range specified above then the so diluted product is frozen. Such freezing can be effected by blast freezing or by placing the product in a suitable deep freeze to freeze overnight. The resultant frozen diluted product may be then broken down to produce a fine slush suitably in the form of a frozen granulated, comminuted or crushed product. The frozen product may be broken down in any suitable apparatus which will crush or grind the frozen product into a granulated or comminuted form. Alternatively the diluted product may be frozen and broken down immediately thereafter in a single apparatus. When such product is returned to the freezer then same does not solidify.

It has been discovered that if a neutral base containing approximately 50% by weight sugar or other sweetening agent is diluted with less than 1/2 part of water then it is difficult to break down the resultant frozen product and that if 4 or more parts of water are utilised then on returning the

broken down product to the freezer same may freeze into a solid block and in any event is unsuitable since the amount of water needed to be added on further dilution to produce a semi-frozen or fluid ice drink, results in a too dilute drink. Whilst it was initially felt that a dilution with less than 2 parts would not be satisfactory, we have now found, with improved freezing and superior cutting techniques, that dilution down to 1/2 part by volume water to 1 part by volume neutral base is possible. In certain circumstances it would be possible to add sugared water in an effort to increase the sugar content of the final drink. It is thus noted that the method of the present invention enables a product to be obtained which, after freezing, can be broken down into a granular, comminuted or crushed form whilst at the same time such product does not re-freeze into a solid block on being returned to a freezer.

In effect, the present invention provides a concentrated semi-frozen or fluid ice product formed from a neutral base containing sugar or other sweetening agent which has been diluted with water in an amount which, when the neutral base is frozen, enables such frozen product to be broken down into a frozen granulated, comminuted or crushed form which does not re-freeze into a solid block when subsequently placed in a cold storage environment.

The concentrated product of the present invention may be supplied to a retailer in quantities as required and thereafter can be utilised as required. The retailer merely has to further dilute the concentrated product in accordance with instructions and thereafter add the desired colouring and flavouring to produce a semi-frozen or fluid ice drink which is then available for sale.

Whilst the invention has been specifically described in relation to a neutral base containing approximately 50% sugar, which is that normally utilised in the manufacture of semi-frozen or fluid ice drinks, it is to be understood that the invention also includes other types of neutral base containing sugar or other sweetening agent. The concentration of sugar or sweetening agent in the neutral base may be selected for each particular purpose.

For example, a base containing either 40% or 65% sugar or other sweetening agent may be used; however, whilst the ratio of base to water is different from that disclosed in relation to the base containing 50% sugar or other sweetening agent we have found that in order to obtain a workable product, the sugar content of the product which is to be frozen and crushed, falls within the range of 10 to 35% by weight of sugar or other sweetening agent.

The product in accordance with the present invention may also be offered for sale to the public, suitably in 1 litre containers for personal use in the manufacture of semi-frozen or fluid ice drinks, or may be used in its undiluted form for sorbets, etc.

It will thus be seen that the method and concentrate of the present invention enables semi-frozen or fluid ice drinks to be prepared without having to utilise expensive apparatus therefor.

#### CLAIMS

1. A process for providing a storable product which can be converted into a semi-frozen or fluid ice drink, comprising diluting a neutral base containing sugar or other sweetening agent with water, the so-produced product then being broken down into a fine granulated, comminuted or crushed form of product which will not solidify when returned to a cold storage location.

2. A process as claimed in claim 1, in which the weight of sugar or other sweetening agent in the storable product is from 10 to 35% by weight.

3. A process as claimed in claim 2, in which the weight of sugar or other sweetening agent in the

storable product is from 10 to 27% by weight.

4. A process as claimed in claim 3, in which the weight of sugar or other sweetening agent in the storable product is approximately 15% by weight.

5. A process as claimed in any one of claims 1 to 4, in which the neutral base contains approximately 50% by weight of sugar or other sweetening agent and in which the neutral base is diluted with water in a ratio of 1/2 part by volume water to 1 part by volume neutral base to 4 parts by volume water to 1 part by volume neutral base.

6. A process as claimed in claim 5, in which the neutral base is diluted with 2 to 4 parts by volume water to 1 part by volume neutral base.

7. A process as claimed in claim 6, in which the neutral base is diluted with approximately 3 parts by volume water to 1 part by volume neutral base.

8. A storable product whenever prepared by a process as claimed in any one of claims 1 to 7.

9. A semi-frozen or fluid ice drink produced by diluting the product as claimed in claim 8.